UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,127	05/23/2007	Travis Wade	28944/50048	4575

57726 7590 11/13/2009

MILLER, MATTHIAS & HULL
ONE NORTH FRANKLIN STREET
SUITE 2350
CHICAGO, IL 60606

EXAMINER	
CARLEY, JEFFREY T.	
ART UNIT	**PAPER NUMBER**
3729	

NOTIFICATION DATE	DELIVERY MODE
11/13/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

lrudaitis@MILLERMATTHIASHULL.COM

Office Action Summary	Application No.	Applicant(s)	
	10/599,127	WADE ET AL.	
	Examiner	Art Unit	
	JEFFREY CARLEY	3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/01/06, 06/11/07, 02/19/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Rosenfeld et al. (US Pat 5259957) hereinafter, Rosenfeld.

Regarding claim 1, Rosenfeld discloses a process in which a support material (10) is provided, which comprises a first and a second surface (14 and opposing face; figs. 1-2); a first anodizing operation is carried out along a first direction on the first surface of said support material in order to form at least one first pore (12) that extends, in this support material, along a the first direction (col. 3, lines 31-40), further comprising a second anodizing operation carried out along a second direction in order to form on the second surface at least one second pore (15) that extends in the support material along a said second direction, different from the first direction (col. 3, lines 46-56).

Regarding claim 2, Rosenfeld discloses the process as claimed in claim 1, wherein an insulating material is formed in the first pore. It is inherent to the nature of anodizing aluminum that anodized aluminum oxide is created. Anodized aluminum oxide is known to be an insulator.

Regarding claim 19, Rosenfeld discloses an element of support material with at least one first pore (12) that extends along a said first direction and at least one second

pore (15) that extends along a said second direction, different from the first direction (fig. 2). In regards to the preamble recitation, that the component is obtained by a process in which a support material is provided, which comprises a first and a second surface; a first anodizing operation is carried out along a first direction on the first surface of said support material in order to form at least one first pore that extends, in this support material, along the first direction; a second anodizing operation is carried out along a second direction in order to form on the second surface at least one second pore that extends in the support material along said second direction, different from the first direction, the applicant is advised that, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964, (Fed. Cir. 1985). In this case, the cited limitations failed to distinguish the claimed structure from the patented Rosenfeld. See MPEP § 2113

Claims 19-25, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Li et al. (US Pat 6325909 B1), hereinafter, Li.

Regarding claim 19, Li discloses an element of support material with at least one first pore that extends along a first direction and at least one second pore that extends along a second direction, different from the first direction (col. 5, lines 34-48; col. 7, lines 45-51; figs. 4a-5b). The examiner maintains that the preamble (process steps) of the

claim is not further limiting to the structure of the apparatus. See rationale in 102(b) rejection of claim 19, above.

Regarding claim 20, Li discloses the component wherein the second pore is at least partly filled with an active material (col. 5, lines 12-16).

Regarding claim 21, Li discloses the component wherein the active material is chosen from a conductor, a semiconductor, a superconductor, a magnetic material and a carbon structure (col. 5, lines 12-16).

Regarding claim 22, Li discloses the component wherein the active material is transparent to light (col. 5, lines 12-16). Transparency to light is inherent to the nature of carbon nanotube structures, which are known to be active materials.

Regarding claim 23, Li discloses the component wherein the active material is an organic material (col. 5, lines 12-16).

Regarding claim 24, Li discloses the component wherein a first electrical contact is produced between the active material and the support material, on the bottom of the second pore (col. 3, lines 57-64).

Regarding claim 25, Li discloses the component wherein the support material constitutes both a self-supporting structure for the component and electrical contact means (col. 5, lines 12-16 and lines 34-37).

Regarding claim 29, Li discloses the component as claimed in claim 19, further including at least one active element connected via the first and second pores to the surface of the support material (col. 4, lines 56-66).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-9, and 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenfeld in view of Li.

Regarding claim 3, Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach that an active material is formed in the second pore

Li teaches that the process, wherein an active material is formed in the second pore (col. 5, lines 12-16), is well known.

It would have been obvious to one of ordinary skill in the art to have combined the anodic substrate preparation of Rosenfeld with the electronic component formation steps of Li. Li teaches anodic sustrate formation steps that are similar enough to those claimed by both the applicant and Rosenfeld, that one of ordinary skill in the art would have immediately thought to combine the processes to produce transistors according to the claimed method.

Regarding claim 4, the modified Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach that the active material is chosen from a conductor, a semiconductor, a superconductor, a magnetic material and a carbon structure.

Li teaches that the process wherein the active material is chosen from a conductor, a semiconductor, a superconductor, a magnetic material and a carbon structure (col. 5, lines 12-16), is well known.

It would have been obvious to one of ordinary skill in the art to have combined Rosenfeld and Li for the reasons stated above.

Regarding claim 5, the modified Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach that the active material is deposited in the second pore by electrodeposition.

Li teaches that the process wherein the active material is deposited in the second pore by electrodeposition (col. 6, lines 23-27), is well known.

It would have been obvious to one of ordinary skill in the art to have combined Rosenfeld and Li for the reasons stated above.

Regarding claim 6, the modified Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach that the active material is a semiconductor material transparent to light.

Li teaches that the process wherein the active material is a semiconductor material transparent to light (col. 5, lines 12-16), is well known. Furthermore, transparency to light is inherent to the nature of carbon nanotube structures, which are known to be active materials.

It would have been obvious to one of ordinary skill in the art to have combined Rosenfeld and Li for the reasons stated above.

Regarding claim 7, the modified Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach that the the semiconductor material is an organic material.

Li teaches that the process wherein the semiconductor material is an organic material (col. 5, lines 12-16), is well known.

It would have been obvious to one of ordinary skill in the art to have combined Rosenfeld and Li for the reasons stated above.

Regarding claim 8, Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach that the support material constitutes both a self-supporting structure for a components and electrical contact means.

Li teaches that the process as claimed in claim 1, wherein the support material constitutes both a self-supporting structure for a components and electrical contact means (col. 5, lines 12-16 and lines 34-37), is well known.

It would have been obvious to one of ordinary skill in the art to have combined Rosenfeld and Li for the reasons stated above.

Regarding claim 9, Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach that a transistor is produced, the source (C) and drain (E) contacts of which are each at one of the ends of the second pore, respectively, and a gate (B) contact is produced by depositing a conducting material on the surface layer.

Li teaches that the process as claimed in claim 1, wherein a transistor is produced, the source (C) and drain (E) contacts of which are each at one of the ends of the second pore, respectively, and a gate (B) contact is produced by depositing a conducting material on the surface layer (col. 3, lines 52-63; fig. 5b), is well known.

It would have been obvious to one of ordinary skill in the art to have combined Rosenfeld and Li for the reasons stated above.

Regarding claim 13, Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach the process wherein at least one active element is enveloped in a matrix comprising the support material.

Li teaches that the process wherein at least one active element is enveloped in a matrix comprising the support material (figs. 1a-1c and 2a-2b), is well known.

It would have been obvious to one of ordinary skill in the art to have combined Rosenfeld and Li for the reasons stated above.

Regarding claim 14, the modified Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach the process wherein an electrically conducting material is deposited in at least one of the first and second pores.

Li teaches that the process wherein an electrically conducting material is deposited in at least one of the first and second pores (col. 3, lines 48-51; col. 5, lines 12-16), is well known.

It would have been obvious to one of ordinary skill in the art to have combined Rosenfeld and Li for the reasons stated above.

Regarding claim 15, the modified Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach the process wherein a thermally conducting material is deposited in at least one of the first and second pores.

Li teaches that the process wherein a thermally conducting material is deposited in at least one of the first and second pores (col. 5, lines 12-16), is well known. Furthermore, high thermal conductivity is inherent to the nature of carbon nanotube structures, which are known to be active materials.

It would have been obvious to one of ordinary skill in the art to have combined Rosenfeld and Li for the reasons stated above

Regarding claim 16, the modified Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach the process wherein an optically conducting material is deposited in at least one of the first and second pores.

Li teaches that the process wherein an optically conducting material is deposited in at least one of the first and second pores (col. 5, lines 12-16), is well known. Furthermore, optical conductivity is inherent to the nature of carbon nanotube structures, which are known to be active materials.

It would have been obvious to one of ordinary skill in the art to have combined Rosenfeld and Li for the reasons stated above

Regarding claim 17, the modified Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach the process wherein at least one line of a material chosen from an electrically conducting material, a thermally conducting material and an optically conducting material is produced on the surface of the support material, in order to connect the active element to an external element.

Li teaches that the process wherein at least one line of a material chosen from an electrically conducting material, a thermally conducting material and an optically conducting material is produced on the surface of the support material, in order to connect the active element to an external element (col. 3, lines 48-51), is well known.

It would have been obvious to one of ordinary skill in the art to have combined Rosenfeld and Li for the reasons stated above

Regarding claim 18, Rosenfeld teaches all of the elements of the current invention as applied above. Rosenfeld, however, does not teach the process as claimed in claim 1, wherein, at least three treatment steps in liquid medium, including the first anodizing operation, the second anodizing operation and an electro-deposition step.

Li teaches that the process as claimed in claim 1, wherein, at least three treatment steps in liquid medium, including the first anodizing operation, the second anodizing operation and an electro-deposition step (col. 5, lines 41-48; col. 6, lines 23-32), is well known.

It would have been obvious to one of ordinary skill in the art to have combined Rosenfeld and Li for the reasons stated above

Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenfeld in view of Lieber et al. (PG Pub. US 2002/0130311), hereinafter Lieber.

Regarding claim 10, Rosenfeld teaches all of the elements as applied to claim 1 above. Rosenfeld, however, does not teach the process wherein the support material is in the form of a portion of wire extending longitudinally parallel to the second direction.

Lieber teaches that it is well known to utilize a support material in the form of a portion of a wire extending longitudinally parallel to the second direction (par. 0173).

It would have been obvious to one of ordinary skill in the art to have combined the anodic substrate preparation of Rosenfeld with the wire transistor formation steps of Lieber. Lieber teaches anodic sustrate formation steps that are similar enough to those claimed by both the applicant and Rosenfeld, that one of ordinary skill in the art would have immediately thought to combine the processes to produce transistors according to the claimed method. Lieber gives further recitation of motivation for combination, “In an embodiment a field effect transistor (FET) is produced using a doped semiconductor having a smallest width of less than 500 nanometers or other width described above. The doped semiconductor can be either a p-type or n-type semiconductor, as is known by those of ordinary skill in the art in FET fabrication.” (par. 0185).

Regarding claim 11, the modified invention of Rosenfeld teaches all of the elements of the current invention as described above, except the process wherein a plurality of pores, including the first pore, are formed, each extending substantially over

the thickness of a surface layer of the wire, radically perpendicular to the second direction.

Lieber teaches that a plurality of pores, including the first pore, are formed, each extending substantially over the thickness of a surface layer of the wire, radically perpendicular to the second direction (fig. 6).

It would be obvious to modify the modified invention of Rosenfeld by incorporation of the pores which extend over the thickness of a surface layer and are perpendicular to the second direction. "In an embodiment a field effect transistor (FET) is produced using a doped semiconductor having a smallest width of less than 500 nanometers or other width described above. The doped semiconductor can be either a p-type or n-type semiconductor, as is known by those of ordinary skill in the art in FET fabrication." (par. 0185). Further, as Lieber shows the utility of such a configuration, but does not demonstrate the method for formation, it is obvious that the procedure must have already occurred and is inherent to the structural limitations.

Regarding claim 12 the modified invention of Li, as described above teaches the process wherein the surface layer of the wire constitutes a layer of dielectric. Creating a dielectric layer is inherent to the nature of anodizing aluminum to create anodized aluminum oxide, which is known to be an electrical insulator.

Claims 26-28 are rejected under 35 U.S.C. 103(a), as being unpatentable over Li in view of Lieber.

Regarding claim 26, Li teaches all of the elements as applied to claim 19 above. Li, however, does not teach that the support material is in the form of a portion of a wire extending longitudinally parallel to the second direction.

Lieber teaches that it is well known to utilize a support material in the form of a portion of a wire extending longitudinally parallel to the second direction (par. 0173).

It would be obvious to use the wire of Lieber to produce an electronic device such as a transistor by means of the process of Li. Lieber gives positive recitation of motivation for combination, "In an embodiment a field effect transistor (FET) is produced using a doped semiconductor having a smallest width of less than 500 nanometers or other width described above. The doped semiconductor can be either a p-type or n-type semiconductor, as is known by those of ordinary skill in the art in FET fabrication." (par. 0185).

Regarding claim 27 the modified invention of Li, as described above teaches, the component wherein the wire portion includes, at the second pore, a surface layer consisting of an electrically insulating material. Creating a dielectric layer is inherent to the nature of anodizing aluminum to create anodized aluminum oxide, which is known to be an electrical insulator.

Regarding claim 28 the modified invention of Li, as described above teaches, the component wherein a second electrical contact, radically external with respect to the surface layer, is produced on this surface layer (col. 3, lines 57-64).

Response to Arguments

Applicant's arguments with respect to claims 1 and 19 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY CARLEY whose telephone number is (571)270-5609. The examiner can normally be reached on Monday through Thursday 8:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Derris Banks can be reached on (571)272-4419. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Derris H Banks/
Supervisory Patent Examiner, Art Unit 3729

/JTC, AU 3729/